

FORM PTO-1390 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 514453-3879	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				U.S. APPLICATION NO. (If known see 37 C.F.R. 1.5) 09/857652	
INTERNATIONAL APPLICATION NO. PCT/EP99/09863		INTERNATIONAL FILING DATE 13 DECEMBER 1999		PRIORITY DATE CLAIMED 11 DECEMBER 1998	
TITLE OF INVENTION FERROELECTRIC ACTIVE-MATRIX DISPLAYS HAVING A BROAD OPERATING TEMPERATURE RANGE					
APPLICANT(S) FOR DO/EO/US Toshiaki NONAKA, Rainer WINGEN					
<p>Applicants herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. <input checked="" type="checkbox"/> This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)). <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (PCT Article 31). <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). <input type="checkbox"/> has been communicated by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). <input type="checkbox"/> have been communicated by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input checked="" type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). <p>Items 11 to 20 below concern document(s) or information included:</p> <ol style="list-style-type: none"> <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. <input type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. <input type="checkbox"/> A substitute specification. <input type="checkbox"/> A change of power of attorney and/or address letter. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). <input checked="" type="checkbox"/> Other items or information: PCT/ISA/210 PCT/IB/304, PCT/IEA/402, 409, 416. 					

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"Express Mail Post Office to Addressee" Service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents and Trademarks, Box PCT Washington, DC 20231.

Edward Nay
(Typed or printed name of person mailing paper or fee)

[Signature]
(Signature of person mailing paper or fee)

U.S. APPLICATION NO. (If known) **09/0857652** (30)INTERNATIONAL APPLICATION NO.
PCT/EP99/09863ATTORNEY'S DOCKET NO.
514453-387921. ☒ The following fees are submitted

CALCULATIONS PTO USE ONLY

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):

Neither international preliminary examination fee (37 CFR 1.482)

nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO

and International Search Report not prepared by the EPO or JPO \$100.00

International preliminary examination fee (37 C.F.R. 1.482) not paid to

USPTO but International Search Report prepared by the EPO or JPO \$860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but

international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)

but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)

and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =**\$ 860.00**Surcharge of **\$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30

months from the earliest claimed priority date (37 CFR 1.492(e)).

\$

CLAIMS

NUMBER FILED

NUMBER EXTRA

RATE

\$

Total Claims

13 - 20 =

0

x \$18.00

\$

0.00

Independent Claims

1 - 3 =

0

x \$80.00

\$

0.00

MULTIPLE DEPENDENT CLAIM(S) (if applicable)

+ \$270.00

\$

TOTAL OF ABOVE CALCULATIONS =

\$

☐ Applicant claims small entity status. See 37 C.F.R. 1.27. The fees indicated

above are reduced by 1/2.

\$

+

SUBTOTAL =

\$

Processing fee of **\$130.00** for furnishing the English translation later than ☐ 20 ☐ 30

months from the earliest claimed priority date (37 CFR 1.492(f)).

\$

TOTAL NATIONAL FEE =**\$ 860.00**

Fee for recording the enclosed assignments (37 CFR 1.21(h)). The assignment must be

accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **\$40.00** per property

\$

0.00

TOTAL FEES ENCLOSED =**\$ 860.00**

Amount to be

refunded:

\$

Charged:

\$

a. ☒ One check in the amount of **\$ 860.00** to cover the above fees are enclosed.b. ☐ Please charge my Deposit Account No. _____ in the amount of \$_____ to cover the above fees.
A duplicate copy of this sheet is enclosed.c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-0320. A duplicate copy of this sheet is enclosed.d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

**WILLIAM F. LAWRENCE, ESQ.
FROMMER LAWRENCE & HAUG LLP
745 FIFTH AVENUE
NEW YORK, NEW YORK 10151**

SIGNATURE

William F. Lawrence

NAME

Dated: June 7, 2001

28,029

REGISTRATION NUMBER

"as originally filed"Ferroelectric active-matrix displays
having a broad operating temperature range

- Replacement of the cathode ray tube with a flat panel screen requires a
- 5 display technology which simultaneously makes it possible to achieve a high resolution, i.e. more than 1 000 lines, a high brightness ($> 200 \text{ Cd/m}^2$), a high contrast ($> 100:1$), a high frame rate ($> 60 \text{ Hz}$), an adequate color representation (> 16 million), a large image format ($> 40 \text{ cm}$), a low power consumption and a wide viewing angle, at low production costs. At present,
- 10 there is no technology which fully satisfies all these features simultaneously.

- Many manufacturers have developed screens which are based on nematic liquid crystals and have been used in recent years in the field of notebook
- 15 PCs, personal digital assistants, desktop monitors etc. Use is made here of the technologies STN (supertwisted nematics), AM-TN (active matrix - twisted nematics), AM-IPS (active matrix - in-plane switching) and AM-MVA (active matrix - multidomain vertically aligned), which are described in detail in the relevant literature (see, for example, T. Tsukuda, TFT/LCD: Liquid
- 20 Crystal Displays Addressed by Thin-Film Transistors, Gordon and Breach 1996, ISBN 2-919875-01-9 and the references cited therein; SID Symposium 1997, ISSN-0097-966X and the references cited therein). Furthermore, mention should be made of the technologies PDP (plasma display panel), PALC (plasma addressed liquid crystal), ELD (electro-luminescent display), FED (field emission display) etc., which are also
- 25 explained in the above-cited SID report.

- Clark and Lagerwall (US patent 4,376,924) were able to show that the use of ferroelectric liquid crystals (FLC) in very thin cells results in opto-
- 30 electrical switching or display elements which have response times which are faster by a factor of up to 1 000 compared with conventional TN (twisted nematic) cells (see, for example, EP-A 0 032 362). Owing to this and other favorable properties, for example the possibility of bistable switching and the fact that the contrast is virtually independent of the
- 35 viewing angle, FLCs are basically suitable for areas of application such as computer displays and TV sets, as shown by a monitor marketed in Japan by Canon since May 1995.

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